



Spaceport News

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John F. Kennedy Space Center

IMAX Space Station movie premieres

Spaceport employees
invited to May 18-19
Visitor Center event

Kennedy Space Center employees have some of the best vantage points for seeing International Space Station processing and Space Shuttle launches, but being upclose during Station assembly on orbit is beyond the experience of most workers.

The latest IMAX release will take KSC employees, their families and friends there.

The awe-inspiring majesty of Space Station construction is being presented daily at Kennedy Space Center Visitor Complex.

"The 3D imagery captured by the IMAX cameras allows those of us on the ground to experience life in the weightlessness of space," said NASA Administrator Sean O'Keefe. "It's an amazing piece of work that we hope may help inspire a new generation of explorers."

"You see what it's really like to live in orbit, 24 hours a day, seven days a week, traveling around the world at more than 17,000 miles per hour."

As a special event for Cape Canaveral



The new 3D IMAX film "Space Station" is showing at the Kennedy Space Center Visitor Complex.

Spaceport employees, the Visitor Complex is hosting a Space Station weekend May 18-19 to celebrate the arrival of the new 3D IMAX film "Space Station."

The weekend will include showings of the new IMAX film, special astronaut appearances,

(See IMAX, Page 6)

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Page 8 – MESA students visit Kennedy Space Center.

KSC testing 'smart' umbilical

Kennedy Space Center engineers are testing the latest in umbilical technology in support of NASA's Space Launch Initiative (SLI) – a technology development effort to establish reliable, affordable space access.

"Umbilicals are the lifeline for any Space Launch Vehicle," said Warren Wiley, KSC's SLI Program Manager. "Fluids including propellants, pressurization gases, and cooling systems, power, communications, and instrumentation readings all flow through the umbilical. They are large devices that are manpower intensive to mate, test and maintain."

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WARREN WILEY
KSC SLI PROGRAM MANAGER

Traditional umbilical systems release at vehicle liftoff (T-0) and can also take extensive connection time – reducing potential flight rate.

The Smart Umbilical Mating System, three years in development

(See SLI, Page 6)

Recognizing Our People

Awards

Outstanding Secretarial/ Management Assistance Awards

Beth Smith, AA-B

Pamela Lohning, PH

You Make A Difference Awards

Wanda Petty, AJ

Jalane Shelton, OP

John Branard, QA-A

Chris Carlson, TA

Gloria Vigilante, UB

Group Certificates of Appreciation

Group I

Jerry Barnes, TA
Rick Deakins, TA
Susu Minderman, TA
David Ungar, TA
Mark Page, TA

Group II

Steve Dutczak, XA
Peggy Seiler, XA
Laurel Lichtenberger, XA
James Gerard, OSU
Les Gold, OSU, Barbara
Wentworth, OSU
Jeanette Petrolia, DNPS
Birdette Brown, B-CC
Damon Talley, B-CC
Billy Specht, DNPS

Group III

Daniel Nieten, YA
Gus Poveda, DNX
Anthony Ciavarella, USA



Station team celebration

The Boeing Co. hosted its traditional biscuits and gravy breakfast in the Space Station Processing Facility cafeteria April 12.

The breakfast was held in celebration of the successful deployment of the S0 Truss Segment and the Mobile Transporter on the STS-110 mission.

The tradition began in December 1998 with STS-88, the first assembly flight. About 250 team members who supported the STS-110 mission attended.

"It's always important to celebrate your successes," said Tip Talone, NASA director of International Space Station and Payload Processing.



International Space Station processing team members gather in the Space Station Processing Facility on April 12 for a biscuits and gravy breakfast to celebrate the successful STS-110 mission payload deployment. Pictured serving the breakfast to Tip Talone, director of International Space Station and Payload Processing, are Roy Tharpe (left), one of the breakfast tradition founders, and Mike Smith, Boeing truss manager.



Employees of the Month

The May Employees of the Month are (left to right, seated) Sandy Gates, Procurement Office; Ann Nelson, Spaceport Services; Laurel Lichtenberger, External Relations and Business Development; (standing) Coleman McCaskey, Shuttle Processing; Ayman Abdallah, ELV & Payload Carriers Programs; Ross Nordeen, ISS/ Payloads Processing; and Mike Dininny, Spaceport Engineering and Technology. Not shown is Ginny Kinslow, Launch Integration.



Administrative Professionals Breakfast

Administrative professionals were honored at the NASA/KSC Administrative Professionals Breakfast on April 24 in the O&C Building's Mission Briefing Room. Supervisors, secretaries and management support assistants attended the event. Beth Smith was recognized as the top administrative professional of the year.

Center volunteers help clean beach

Kennedy Space Center employees joined with Fish and Wildlife Services (FWS) to clear the beach of debris to ensure healthy habitat for nesting Wilson's plovers and endangered sea turtles.

Twenty-nine KSC employees braved the rainy conditions to clean the Merritt Island National Wildlife Refuge beach.

Florida is the United States most important place for nesting sea turtles, and the Space Coast is said to be the second most important habitat next to the Archie Carr National Wildlife Refuge just to the south.

The volunteer cleanup group concentrated in the area south of Launch Pad 39A and north of the beach house, where most of the debris collects.

"It was pretty sobering how much trash was there," said Mark Femminino, a wildlife enthusiast who works in Shuttle Processing. "However, we were interrupted from completing the task in a small area by a pair of nesting Wilson's plovers, a species of management concern. The female tried a broken wing ploy to keep the focus on her and away from the nest."

"The refuge manager radioed ahead to warn everyone about the nest and we moved to the waterline and away from the nesting plovers. Very few people realize that these plovers need undeveloped beach to breed and nest."

The most common items found were plastic and glass bottles of every shape and size.



Volunteers from Kennedy Space Center help the Fish and Wildlife Services clean the beach.

Two hazardous waste workers were called out to pick up an oil barrel that had washed ashore that was full of "something." The most-alarming thing found was a chewed-up life jacket.

Because of the increase in security, the annual cleanup was conducted during the work week and open only to badged employees.

"It is great that our employees have enough

thoughtfulness for the environment to take a little time out of their busy schedules to help clean our beach," said Marc Epstein, senior biologist for FWS. "For those that signed up or showed up, it shows a special consideration on their part to have environmental awareness, appreciation, and respect for our landscape and wildlife resources."

Marty MoneySmith programs a computer numeric-controlled milling machine to manufacture components for a next generation umbilical.



Before critical launch support equipment debuts at Kennedy Space Center launch pads, it's thoroughly tested by Dynacs Inc. engineers and technicians at the Launch Equipment Test Facility (LETF).

The Dynacs team also works with NASA and contractor scientists, engineers and technicians to develop launch equipment technology improvements for the Space Shuttle, Space Station, Expendable Launch Vehicles and future vehicles.

KSC's spaceport and range technology development efforts and technology spinoffs are supported by the diverse capabilities of the LETF.

Current development projects in the area include the development of an umbilical for next-generation launch vehicles, a fail-safe jack screw for operational use at KSC and within industry, and a new tool that measures the circularity of the Shuttle solid rocket motor segments.

The LETF includes a machine shop, fabrication areas, the Cryogenics Testbed, other indoor testbed and technology development areas, and a large testing yard.

"We work with everything from massive pieces of equipment to highly sophisticated electronics, so the wide range of expertise in our group is essential," said Steve Sojourner, director of mechanical development and testing for Dynacs. "We're pretty much a one-stop shop."

One area of expertise, for example, vibro-acoustic research and testing, helped lure the International Congress on Sound and Vibration to the United States this year. The group will meet in Orlando July 8-11 and will tour KSC.

Another high-profile area of the LETF is the Cryogenics Testbed, dedicated to low-temperature research and engineering development for components, systems and unique aerospace applications.

But the most visible area of the LETF is its huge testing yard. Ground support equipment testing and certification takes place in the outdoor area, which contains equipment for simulating flight vehicle motion on the launch pad, qualifying load bearing fixtures, testing complex launch pad mechanisms, and performance testing of components and valves for cryogenic and hazardous fluid systems.

Indoors, other LETF capabilities include precision machining, high-pressure tubing fabrication as well as structural fabrication of large mechanisms. Electrical fabrication areas are used to provide electrical assembly, termination and cable fabrication for building aerospace-quality hardware.

The LETF also features an assembly and development high bay. The environmentally controlled area is used to assemble, integrate and test Ground Support Equipment prior to deployment in an operational environment.

The launch support equipment test and development capabilities that are provided by the LETF will be enhanced by the planned Advanced Technology Development Center (ATDC). The first phase of the ATDC, which is being created by NASA KSC at Space Launch Complex 20, at Cape Canaveral Air Force Station, is expected to be complete by November 2002.

"The ATDC will enable us to perform full-scale, integrated testing in a near-launch environment," said Greg Clements, NASA ATDC project manager. "Adding ATDC to the LETF and other on-center capabilities will provide a comprehensive range of testing capabilities for our customers."

INSIDE t



Engineer John Trautwein and machinist Bobby Cox inspect a feature after functional testing in the LETF Gaseous Oxygen

the LETF



Jim Gibson puts finishing touches on a new gaseous nitrogen pressure regulation panel.



Machinist Art Hendren manufactures a part for a new hazardous gas detection system.



a prototype jackscrew with a failsafe Vent simulator.

At right, NASA intern Brekke Scholtens studies the design for a new umbilical system quick disconnect. Below, technicians Tom Naylor and Charlie Baker inspect a Shuttle liquid oxygen pump prior to testing it in the LETF water flow system.



Joseph Dean and Kenny Heckle verify the operation of a new tool that measures the circularity of the Shuttle solid rocket motor segments.



Wayne Heckle prepares for insulation testing by filling a boil-off calorimeter with liquid nitrogen in the Cryogenics Test Laboratory.



Wayne Crawford checks the electrical control panel of the Trajectory Simulation Mechanism prior to its initial operational use. This new test fixture will be used to better predict the vibro-acoustic loads on ground equipment and structures for future NASA and Air Force launch vehicles.

SLI ...

(Continued from Page 3)

by Rohwetter Systems of Oviedo and NASA will serve as a modern, next-generation umbilical system.

"The concept is to replace a T-0 umbilical with an automated umbilical which has a mate, demate and remate capability," said Tom Lippitt, Spaceport Engineering and Technology lead engineer. "The ability to quickly and reliably mate and demate umbilical connectors under automated control, along with remote connection verification, would reduce the time and labor hours required to prepare for launch.

"The Smart Umbilical Mating System will also be used as a testbed for quick disconnect development and for advance control and leak detection technologies."

The system will be used as a development tool for future launch vehicle technology development. According to Lippitt, several technologies being developed relate to umbilicals, such as ice suppression, leak sensing, quick disconnects and others. By using the Smart Umbilical Mating System, the new technologies can be tested in cryogenic conditions.

"In addition to ground-based applications, planetary systems and rovers will require umbilical mating for propellant loading and



Tom Lippitt, Spaceport Engineering and Technology lead engineer demonstrates the Smart Umbilical Mating System in the Launch Equipment Testing Facility high bay at Kennedy Space Center.

electrical and data connection," said Lippitt. "The technology developed as part of this project may be applied to develop simple, reliable, self-sufficient mating. Some of this work will be required to make certain missions and systems feasible – Mars methane-fueled rovers."

KSC is responsible for managing SLI's Ground Operations Project – NASA's effort to reduce the risk

associated with developing a Second Generation Reusable Launch Vehicle by defining, developing and testing technologies needed to safely and cheaply access space.

"The project will address the SLI goals of reducing operating costs by reducing the maintenance and manpower needed to do the connections and increase safety by automatically performing hazardous

tasks and reducing potential failure modes," Wiley said.

Space Launch Initiative is a NASA-wide research and development program – managed by the Marshall Space Flight Center – designed to improve safety, reliability and cost effectiveness of space travel for second generation reusable launch vehicles.

For more SLI information, visit www.slinews.com.

IMAX ...

(Continued from Page 1)

and free build-your-own Space Station kits for the kids.

For Space Station weekend only, all KSC and Cape Canaveral Air Force Station badged employees may purchase up to six limited admission tickets for just \$7.50 each, plus tax.

Each special ticket will include one viewing of the new IMAX "Space Station," as well as limited admission to the Visitor Complex.

Limited admission includes Astronaut Encounter, Mad Mission to Mars 2025 and selected exhibits.

Tickets will only be available at the KSCVC ticket plaza May 18-19. Employees must show badges. For ticket information, call 449-4400.

"Space Station," produced by IMAX in cooperation with NASA and sponsored by Lockheed Martin Corp., takes audiences on an incredible cinematic journey of discovery from planet Earth to the International Space Station.

Amazing 3-D technology enables audiences to sit inside the Space Shuttle during launch, experience the exhilaration of a spacewalk, and float effortlessly through the Space Station.

Between December 1998 and August 2000, more than 13 miles of film flew into space for use in two IMAX 3D cameras.

Working closely with IMAX, 25 astronauts and cosmonauts were trained to use the high-tech equipment.

They had to learn how to be

directors, cinematographers, and lighting and sound experts.

One of those astronauts will be on hand at the Visitor Complex May 18. Former Space Shuttle Commander and IMAX filmmaker Brian Duffy will make several appearances and participate in meet and greet sessions throughout the day.

In October 2000, Duffy commanded a crew of seven on STS-92 Discovery. During the 13-day mission to the International Space Station, an IMAX 3D camera captured on film the installation of the huge Z1 Truss, which is the "backbone" of the International Space Station, as well as three space walks.

The successful team of NASA, IMAX and Lockheed Martin has produced five challenging and

inspiring space films, including "The Dream Is Alive" (1985), "Blue Planet" (1990), "Destiny in Space" (1994) and "Mission to Mir" (1997), exposing people around the world to the wonders of space exploration. "Space Station" is the story of the unique partnership of 16 nations to build a permanent science outpost in low Earth orbit.

Additional details about the film are available on a special interactive Web site, filled with in-depth information, a photo gallery, astronaut interviews and a complete guide to showings. The Web site is at <http://www.imax.com/spacestation>.

For more information on the Visitor Complex special event, call 321/449-4444 or visit Web site www.KennedySpaceCenter.com.

MESA students learn about KSC careers

A panel of Kennedy Space Center employees being interviewed may sound like a news conference, yet the April 17 gathering at the KSC Visitor Complex was anything but that.

After External Relations and Business Development Director JoAnn Morgan and Education Programs and University Research Division Chief Pam Biegert welcomed the 87 high school seniors from New Mexico, the students asked seven role models questions about careers and personal challenges.

The students, who are involved in the New Mexico Mathematics, Engineering and Science Achievement Program (MESA), listened to lectures, toured the Center, participated in a student educational workshop in the Center for Space Education, and witnessed the STS-110 landing.

Paul Mackey, a University of New Mexico graduate and the first NASA Scholar, spoke to the students about high school and college experiences that led to his career as an engineer with NASA.

"I'm just so excited to see what's out here," said Valerie Salim, Rio Grande High School student, Albuquerque. "I plan to spend my four days in Florida looking for new career ideas."

The visit is part of the year-round, non-profit NM MESA program. The national initiative promotes educational enrichment for pre-college students from historically under-represented ethnic groups. Starting in middle school through high school, MESA prepares students for college majors in mathematics, engineering, science and related fields.

NM MESA receives financial support from the state of New Mexico, numerous state and national corporations and foundations, federal agencies, and private donations.

"I'd like to do something involving biology and engineering – maybe a physical therapist for astronauts," said Jonathan Vigil, a student from Robertson High School, Las Vegas, Nev. "I'm also enjoying the weather and learning about the employees' extraordinary



External Relations and Business Development Director JoAnn Morgan (left) addresses New Mexico Mathematics, Engineering and Science Achievement Program (MESA) students. The students recently visited Kennedy Space Center to learn about the space program and potential careers. The visiting seniors, pictured above in the Rocket Garden at KSC Visitor Complex, earned the incentive field trip through their academic performance.

accomplishments."

While the program focuses on students from New Mexico, living there isn't the only acceptance criteria.

The visiting seniors were a selected group who earned this incentive field trip to KSC based upon grades, completion of four years of high school math and science classes (which is above the required graduation minimum), participation in field trips and community volunteer projects, meeting NM MESA program requirements, and a career interest in NASA.

Ninety-eight percent of participants will go on to college.

"The number of students in college earning math, science, technology or engineering degrees continues to decline for U.S. students. But the number of jobs in these fields that need to be filled continues to increase. A major segment of pre-college students are the historically under-represented ethnic groups. It is to this group that programs like MESA offer the way to help fill the future needs of the scientific and technical world," said Pre-College Programs Lead Steve Dutczak. "An educational enrichment program like MESA can offer the undecided student the impetus to pursue a goal in science and technology. By seeing others

who have accomplished their dream they can realize that they too can make their dream come true."

NM MESA students at KSC represented six regions of New Mexico – from the most northern to the most southern parts of the state as well as some surrounding areas. Many of the students had to fundraise and work various jobs to pay for their trip to Florida.

"MESA students are our future engineers, scientists, and technicians," said Karroll Purer, KSC education specialist. "Many have faced challenges, such as financial constraints and being first generation college students. MESA students are achievers!"

10 years ago: Endeavour launches for first time

Congressional authorization to construct the fifth Space Shuttle, after Challenger was lost in a 1986 accident, was granted Aug. 1, 1987.

Endeavour (OV-105) first arrived at Kennedy Space Center's Shuttle Landing Facility May 7, 1991, atop NASA's new Shuttle Carrier Aircraft, and launched May 7, 1992.

A national competition in public schools produced the name of this fourth orbiter, named after the first ship commanded by 18th century British explorer James Cook.

On its maiden voyage in 1788, Cook sailed into the South Pacific and around Tahiti to observe the passage of Venus between the Earth and the Sun.

When built, Endeavour featured new hardware designed to improve and expand orbiter capabilities, including a 40-foot-diameter drag chute to reduce the orbiter's rollout distance by 1,000 to 2,000 feet; modifications to allow up to 28-day missions; updated avionics systems; and an improved version of the Auxiliary Power Units (APUs) that provide power to operate the Shuttle's hydraulic systems.

The space agency's newest orbiter began flight operations in 1992 on mission STS-49, the rescue and repair of Intelsat.

Dan Brandenstein, currently vice president of CSOC at Lockheed Martin Space Operations, was commander on the mission.

"For a vehicle brand new 'out of the shop,' Endeavour performed flawlessly," he said, "which allowed



Endeavour was the first orbiter to employ a 40-foot-diameter drag chute during mission landings.

Remembering Our Heritage

us to totally focus our time on the mission, capturing the satellite."

The orbiting Intelsat had been stranded in unusable orbit since its launch aboard a Titan rocket in March 1990. The mission was to capture the satellite and attach a perigee kick motor that would propel it into a proper orbit.

Capture proved difficult for two astronauts on two spacewalks; the goal was achieved on a third spacewalk with three astronauts.

Bruce Melnick, who is currently vice president-Senior Site Executive with Boeing Space Coast Operations, was a mission specialist on that flight. He recalls, "Endeavour, STS-49, was my second flight. My role was... flight engineer going

uphill and coming home. On orbit, my primary responsibility was to operate the Remote Manipulator System (robotic arm) both during the Intelsat reboost part of the mission as well as during ASEM (Assembly of Station by EVA Methods). This was a task to evaluate on-orbit construction at various locations around the orbiter to assess not only the assembly challenges for the EVAers, but also the visibility constraints for the RMS operator.

The first landing of Endeavour was also the first use of a drag chute on landing, at Edwards Air Force Base, Calif.

Brandenstein remembers the event: "We used a procedure

slightly different from later landings. We made sure the nose wheel was on the ground first [before deploying the chute]. Now it's deployed after main gear touch-down. I felt the tug and it was pretty close to what it had been in the simulator. It worked fine."

Melnick concludes, "How fast time flies! It's hard to believe it's already been 10 years since we flew. It seems like only yesterday."

Since 1992, Endeavour has made other significant flights: the first SPACEHAB mission, STS-47, in June 1993; the first manned flight to the International Space Station, STS-88, in December 1998, carrying the Unity connecting module; and the Radar Topography mission, STS-99, in February 2000.

Endeavour is scheduled to fly on its 18th mission May 30, a Space Station assembly flight and transfer of Station resident crews.

International sound, vibration congress set

The Ninth International Congress on Sound and Vibration will be held July 8-11 at the University of Central Florida (UCF) in Orlando. This year's congress is co-sponsored by Kennedy Space Center, UCF, and the International Institute of Acoustics and Vibration. KSC Director Roy Bridges Jr. will open the congress. More than 400 technical papers will be presented in addition to keynote lectures and tutorials, workshops, and an exhibit of sound and vibration equipment. For more information or on-line registration, please contact KSC co-chairs Raoul Caimi or Ravi Margasahayam, or visit the Web site at <http://www.mmae.engr.ucf.edu/icsv9>.



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